

Radiological Surveys



Radiological Surveys

- MODULE OBJECTIVES
 - Explain Why a Radiological Survey Must Be Performed
 - Select the Proper Equipment to Perform Various Types of Surveys
 - Perform Radiological Surveys
 - Develop A Survey Map
 - Properly Document All Actions Performed

Radiological Surveys

Two Types:

- Radiation Survey
 - Performed to Ensure That Personnel Exposure Levels Are As Low As Reasonably Achievable (ALARA)
 - To Assess or Detect Exposure Levels From Either a Removable or Fixed Source

Radiological Surveys

- Radiation Survey
 - Survey Performed To Detect The Amount Of Radiation Present
 - Type Of RADIAC: AN/PDR-77, AN/VDR-2, or Equivalent
 - Document Survey On A Radiological Survey Form



Radiological Surveys (cont'd)

- Contamination Surveys
 - Removable Contamination
 - surface contamination, which can be easily removed
 - Fixed Contamination
 - Surface contamination which is quite firmly attached

Prior to Performing a Radiation Survey

- Ask Yourself
 - Why Am I Performing the Survey
 - What Type(s) of Radioactive Material Are Present
 - What Types of Radiation Do These Materials Emit
 - Has There Been a Radiation Survey Conducted Previously

Obtain Appropriate Tools

- Survey Form(s), Clipboard, Pen
- Dosimetry (if required)
- RADIAC, Ensure Pre-operational Tests Are Performed
 - Check Calibration
 - Check For Damage
 - Check Batteries
 - Perform Response Test With Radioactive Source

Performing a Radiation Survey

- Turn the Power On
- Use the Audible Indicator
- Obtain a Background Reading
- Take Sufficient Readings
 - Entrance
 - Maximum Radiation Level in the Storage Area
 - Radiation Level at Accessible Points Outside the Storage Area

Performing a Radiation Survey



General Area
Readings

Contact Readings On
Storage Locker



Documenting A Radiation Survey

- Document all readings
 - Background
 - General Area
 - Contact
- Sketch That Depicts the Area Surveyed
 - Entrance
 - Locker/Storage Location

Performing A Removable

Contamination Survey

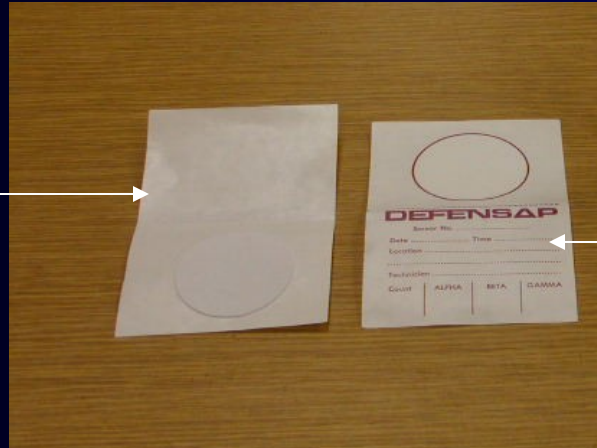
- Performed to Detect Loose Contamination
- Measurement Is Made by Using Smears
- The Surface Is Wiped in a S-shaped Pattern (Approx. 100cm²)

Performing A Removable Contamination Survey

- Removable Contamination Survey
 - Performed to Detect the Presence of Removable Contamination
 - Test Usually Done With Certain Types Of Filter Paper
 - NUCON For Gross Alpha/Beta
 - Metrical For Tritium And Nickel-63
 - Use Normal Pressure And Wipe The Area In A S-shaped Pattern (Approx. 100cm²)

Contamination Survey

NUCON
Wipes



Outside
Protective
Jacket



NUCON Wipe



Performing Alpha/Beta
Contamination Survey

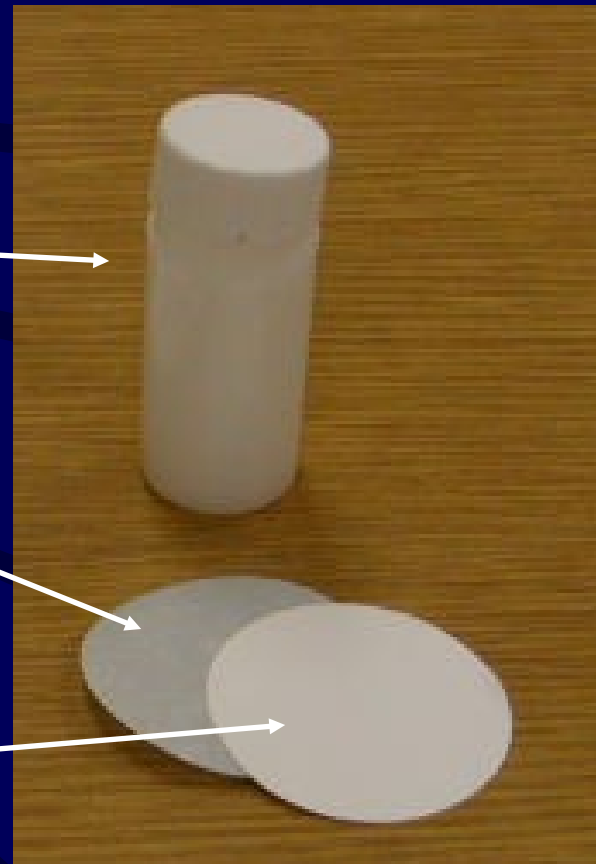
Contamination Survey (Tritium and Nickel-63)

Place the Wipe in
the Vial

Protective Blue Separator

Don't Use The Blue!

Metrical Wipe



Best Place To Take A Sample

- Your Workspace/maintenance Bench
- Storage Shelving
- Well-traveled Areas of the Floor
- Floor Drains
- Places Where People Commonly Place Their Hands

Fixed Contamination Survey

- Beta/Gamma - Pancake Type Probe, or Thin Walled Geiger Tube (DT-695)
- Alpha – DT696 Alpha Probe
- Measure the Background Well Away From the Surface to Be Monitored
- Pass the Detector Slowly Across the Surface
- Rule-of-thumb Is To Move the Probe Approximate One Probe Width Per Second

Which One is Correct?



Documenting Your Contamination Survey

- Sketch the Area and Location of the Wipes
- List the Wipes on the Wipe Test Analysis Request Form
- Send the Form and Wipes to the CECOM Laboratory at Fort Monmouth for Counting

SURVEYING WITH A MICRO-R METER

- Is Very Sensitive to Gamma Radiation
- Energy Dependent
- Used to Locate a Missing Gamma Source
- Not Calibrated, Use for Indication Only



SURVEY FILES

- Records of Surveys Are Legal Documents
- Maintain Records on File for Three Years
- Files Should Contain the Results of Wipe Tests and Radiation Dose Rates

Radioactive Material Storage Areas

- Postings
 - Two On The Door
 - NGB Placard
 - Caution Radioactive Mater

ARMY NATIONAL GUARD
RADIATION SAFETY

NOTICE

NO EATING, DRINKING, SMOKING, CHEWING or APPLYING OF COSMETICS IS PERMITTED IN THIS AREA

Your Points of Contact for RADIOACTIVE MATERIALS used by this unit and/or stored in this area are:

LOCAL RADIATION SAFETY OFFICER (LRSO): PHONE # _____

ALTERNATE LRSO: PHONE # _____

STATE RADIATION SAFETY OFFICER (SRSO): PHONE # _____

RADIATION SAFETY STAFF OFFICER (RSSO) for the NATIONAL GUARD BUREAU (NGB):
AFCOM DIRECTORATE for SAFETY (DSS) (DSN 987-3112/4427; COM 732-427-3112/4427)

The following documents are available for review by contacting your LRSO:

- Radiactive Materials Standing Operating Procedure (SOP) for this unit/storage area.
- Applicable Technical Manuals (TM) & Technical Bulletins (TB).
- AR 11-9, "Army Radiation Safety Program" & NGR 385-11, "Radiation Protection Program"
- The following documents are available for review by contacting your LRSO or SRSO:
 - Nuclear Regulatory Commission (NRC) Licenses & Army Radiation Authorizations and Permits (ARAA/ARF).
 - Title 10, Code of Federal Regulations (CFR) Parts 19, 20, and 21.

The following documents must be posted in an area that is common to the workplace (i.e. break room, safety board):

- NRC Form 3, "Notices to Employees."
- Section 206, Energy Reorganization Act.
- any Notice of Violations.

Post the following documents where radioactive materials are used, stored, or maintained:

RADIATION SAFETY NOTICE.
NON-RADIOACTIVE MATERIAL SIGN.

your SRSO or the NGB RSSO for further information or assistance.

CAUTION



RADIOACTIVE MATERIALS

- Postings
 - Two On The Safety Board (Break Room, etc..)
 - Public Law (Section 206)
 - NRC Form 3

(d) The Commission is authorized to conduct such reasonable inspections and other enforcement activities as needed to insure compliance with the provisions of this section.



Summary

- The Army and Federal Regulations Require Radiological Surveys
- Types of Radiological Surveys
 - Radiation
 - Contamination
 - Removable
 - Fixed
- Prior to Performing Survey
 - Gather Information
 - Obtain Supplies
 - Perform Pre-operational Test

Summary (Cont'd)

- Performing a Radiation Survey
 - Background Measurements
 - General Area Measurements
 - Contact Measurements
- Performing a Removable Contamination Survey
 - Nucon
 - Metricel
 - 100cm²
 - Complete Wipe Test Analysis Request Form
 - Send Sample to CECOM

Summary (Cont'd)

- Performing a Fixed Contamination Survey
 - Alpha
 - DT669 Alpha Probe
 - Beta/gamma
 - DT695, Pancake Probe
 - Audible Indication On
 - Move Detector Slowly

Summary (Cont'd)

- Documentation
 - Survey Map
 - Wipe Test Results
 - Calibration Certificates
 - Response Test Log(s)
 - Maintain Records for 3 Years

Summary (Cont'd)

- Postings
 - Two on the Door
 - Caution Radioactive Material
 - NGB Placard
 - Two on the Safety Board
 - Public Law Section 206
 - NRC Form 3

Radiation Surveys

Questions

Forms